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Chi-An Kao

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DUANE MORRIS, LLP

IP DEPARTMENT

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PHILADELPHIA, PA 19103-4196

EXAMINER

NGUYEN, KHIEM D

ART UNIT

PAPER NUMBER

2823

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/661,793

**Applicant(s)**

KAO ET AL.

**Examiner**

Khiem D. Nguyen

**Art Unit**

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 8-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-14 is/are allowed.
- 6) ☒ Claim(s) 8-11 and 15-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 8-11 and 15-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Mui et al. (U.S. Patent 6,924,088).

In re claim 8, Mui discloses a system for creation of an opening of controllable format through a layer of insulation material, comprising:

means 370 for creating an opening (via patterns P, col. 6, lines 29-30) through a layer of etch resist material 250 (col. 6, line 29) provided over the surface of a layer of insulating material (col. 6, lines 31-37) having been deposited over the surface of a substrate 200 (col. 6, lines 23-51 and FIG. 2);

means for measuring 310 an obtained critical dimension measurement of the opening created through the layer of etch resist material 250 (col. 6, lines 40-41 and FIG. 2);

means, including a feedback mechanism (col. 9, lines 11-24), for assuring that the obtained critical dimension measurement of the opening created through the layer of etch resist material 250 is within design specification, the feedback mechanism

communicating with the means for creating an opening through a layer or etch resist material **250** to control the critical dimension (CD) measurement of the opening (col. 9, lines 11-44);

means **370** for creating an opening through the layer of insulation material, whereby a diameter of the opening through the layer of insulation material is dependent on a diameter of the opening (via patterns P, col. 6, lines 29-30) created through the layer of etch resist material **250** (col. 6, lines 34-51); and

means, including a feedback mechanism, (col. 9, lines 5-24) for assuring that the opening created through the layer of insulation material is within design specification (col. 8, line 58 to col. 9, line 4 and FIG. 3).

In re claim 9, as applied to claim 8 above, Mui discloses all claimed limitations including the limitation wherein means, including a feedback mechanism (col. 9, lines 5-24), for assuring that an obtained critical dimension measurement of the opening (via patterns P, col. 6, lines 29-30) created through the layer of etch resist material **250** is within design specification comprising: means for linking to a software supervisory function **320**, thereby including data transmission functions (col. 9, lines 13-17), means for linking to a software function equally being linked to a software supervisory function, thereby including data transmission functions; means for data manipulating capabilities, thereby including manipulating interdependent data ; means for interfacing with semiconductor equipment, thereby including equipment functioning in a supporting role to the semiconductor equipment; and means for creating instructions for the

semiconductor equipment, thereby including equipment functioning in a supporting role to the semiconductor equipment (col. 9, lines 5-24).

In re claim 10, as applied to claim 8 above, Mui discloses all claimed limitations including the limitation wherein means for assuring that the opening created through the layer of insulation material is within design specification comprising: means for linking to a software supervisory function 320 (col. 9, lines 13-15), thereby including data transmission functions, means for linking to a software function equally being linked to a software supervisory function, thereby including data transmission functions; means for data manipulating capabilities, thereby including manipulating interdependent data; means for interfacing with semiconductor equipment, thereby including equipment functioning in a supporting role to the semiconductor equipment; and means for creating instructions for the semiconductor equipment, thereby including equipment functioning in a supporting role to the semiconductor equipment (col. 9, lines 5-24).

In re claim 11, as applied to claim 8 above, Mui discloses all claimed limitations including the limitation wherein the system further comprising means for creating an opening (via patterns P, col. 6, lines 29-30) having non-linear sidewalls through a layer of insulation material by applying a high-polymer based etch to the surface of the layer of insulation material (col. 6, lines 23-51).

In re claim 15, Mui discloses a system for creation of an opening of controllable format through a layer of insulation material, comprising:

means 370 for creating an opening (via patterns P, col. 6, lines 29-30) through a layer of etch resist material 250 (col. 6, line 29) provided over the surface of a layer of

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insulating material (col. 6, lines 31-37) having been deposited over the surface of a substrate **200** (col. 6, lines 23-51 and FIG. 2);

means, including a feedback mechanism (col. 9, lines 11-24), for obtaining a critical dimension measurement of the opening created through the layer of etch resist material **250** assuring that the critical dimension measurement (CD) is within design specification, the feedback mechanism communicating with the means for creating an opening through a layer of etch resist material **250** to control the critical dimension measurement (CD) of the opening (col. 9, lines 11-44);

means **370** for creating an opening having non-linear sidewalls through the layer of insulation material by applying a high-polymer based etch to the surface of the layer of insulation material, whereby a diameter of opening having non-linear sidewalls is dependent on a diameter of the opening (via patterns P, col. 6, lines 29-30) created through the layer of etch resist material **250** (col. 6, lines 34-51); and

means, including a feedback mechanism, (col. 9, lines 5-24) for assuring that the opening created through the layer of insulation material is within design specification (col. 8, line 58 to col. 9, line 4 and FIG. 3).

In re claim 16, Mui discloses a system for creation of an opening of controllable format through a layer of insulation material, comprising:

means, including a feedback mechanism (col. 9, lines 11-24), for creating an opening (via patterns P, col. 6, lines 29-30) through a layer of etch resist material **250** provided over the surface of a layer of insulating material (col. 6, lines 31-37) having been deposited over the surface of a substrate **200**, such that the opening has a critical

dimension measurement (CD) that is within design specification; (col. 9, lines 11-44 and FIG. 2);

means **370** for creating an opening through the layer of insulation material, whereby a diameter of layer of insulation material is dependent on a diameter of the opening (via patterns P, col. 6, lines 29-30) created through the layer of etch resist material **250** (col. 6, lines 34-51); and

means, including a feedback mechanism, (col. 9, lines 5-24) for assuring that the opening created through the layer of insulation material is within design specification (col. 8, line 58 to col. 9, line 4 and FIG. 3).

In re claim 17, as applied to claim 16 above, Mui discloses all claimed limitations including the limitation wherein the means, including a feedback mechanism (col. 9, lines 11-24), for creating an opening (via patterns P, col. 6, lines 29-30) include means for making corrections to an original critical dimension measurement (CD) that is not within design specification (col. 9, lines 13-24).

***Allowable Subject Matter***

3. Claims 12-14 were previously allowed over prior art of record as indicated in the Office Paper mailed on March 08<sup>th</sup>, 2005.

***Response to Applicants' Amendment and Arguments***

4. Applicants' arguments filed on July 24<sup>th</sup>, 2007 have been fully considered but they are not persuasive.

Applicants contend that the reference Mui et al. (U.S. Patent 6,924,088), herein known as Mui does not recite the feature of a feed forward system/means, based on

measured CD's communicating with a system that creates an opening in the etch resist layer and since Mui also does not provide a feedback mechanism that controls the etch resist CD, each of independent claims 8, 15 and 16 are distinguished from Mui.

In response to Applicants' contention that Mui does not recite the feature "means, including a feedback mechanism, for assuring that the obtained critical dimension measurement of the opening through the layer of etch resist material is within design specification, the feedback mechanism communicating with the means for creating an opening through a layer of etch resist material to control the critical dimension measurement of the opening", Examiner respectfully disagrees.

Mui et al. disclose a system for creation of an opening comprising: means, including a feedback mechanism (col. 9, lines 11-24), for assuring that the obtained critical dimension measurement of the opening created through the layer of etch resist material **250** is within design specification, the feedback mechanism communicating with the means for creating an opening through a layer of etch resist material **250** to control the critical dimension (CD) measurement of the opening (col. 9, lines 11-44).

In (col. 8, line 58 to col. 9, line 24), Mui et al. disclose creating an opening through the resist layer **250** using etcher **370** (col. 7, lines 2-3), a measuring tool **310** (col. 8, line 66 to col. 9, line 4) for measuring an obtained critical dimension (CD) measurement of the opening, and means, including a feedback mechanism (i.e., a processor **320**), for assuring that the obtained critical dimension measurement of the opening is within design specification (col. 9, lines 11-24). Furthermore, Mui et al. disclose that the obtained information by the measuring step (via measuring tool **310**) are



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fed back to the etcher 370 to adjust the etch recipe (col. 9, lines 57-59). This show that the feedback mechanism (processor 320) communicating (via providing the etcher 902 calculated etch recipe) with means for creating an opening (etcher 370) through the resist material 250 to control (via adjusting...) the critical dimension measurement of the opening.

For this reason, Examiner holds the rejection proper.

### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

### ***Correspondence***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khiem D. Nguyen whose telephone number is (571) 272-1865. The examiner can normally be reached on Monday-Friday (8:30 AM - 5:30 PM).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KN

October 04, 2007

*Brook Kebede*  
BROOK KEBEDE  
PRIMARY EXAMINER